

now pending in the present application. Applicants respectfully traverse the rejections under section 103 to the extent they may be considered applicable to any of the pending claims.

ICC, Lindbloom, and Stone et al. fail to disclose or suggest the inventions defined by the claims. Moreover, such references provide no teaching that would have suggested the desirability of modification to arrive at the claimed inventions. Applicants' remarks below are limited to the rejected claims.

In contrast to the methods of amended claims 1-5 and 11 or the data storage medium as set forth in amended claims 19-23, for example, the applied references do not suggest the use of forward transformation profiles to generate device-independent color values for source and destination imaging systems, along with calculation of color conversions by recursively reducing differences between the device-independent color values for different combinations of the source and destination systems, and construction of color maps using the color conversions and user preferences. ICC, Lindbloom, and Stone et al. also provide no teaching that would have suggested, for a selected combination, determining whether one of the color maps corresponds to the selected combination and selected user preferences and if so, retrieving the corresponding color map, or if not, constructing a new color map.

Unlike the inventions of claims 1-5, 11, and 19-23, the techniques described by ICC, Lindbloom, and Stone et al. are relatively inflexible with respect to changes in user preferences such as, for example, illuminant and observer conditions, gamut mapping selections, and color space selections. In particular, ICC describes the use of generally static device profiles that govern the forward and inverse transformation of colors for different devices. If user preferences change, the ICC device profiles are recalculated. The inventions of amended claims 1-5, 11, and 19-23, in contrast, do not require recalculation of device profiles when user preferences change. Instead, the method permits construction of a new color map using existing color conversions and the selected user preferences. The color conversions are calculated on the basis of existing forward transformation profiles for the source and destination devices.

Moreover, in accordance with amended claims 1-5, 11, and 19-23, it is not even necessary to reconstruct color maps that govern the transformation of color values for a selected combination of imaging devices and selected user preferences. Instead, when a transformation for a particular combination of devices and user preferences is requested, the resulting color map is stored. This represents another fundamental difference over the applied references. The next time a transformation is requested, it is determined whether one of the stored color maps corresponds to the selected combination and user preferences. If so, the stored map can be retrieved to perform the transformation. If not, a new map is constructed for the selected combination and user preferences.

In the Office Action, the Examiner characterized Lindbloom as disclosing the storage of color maps as claimed. Applicants respectfully disagree. Lindbloom (in section 7.1) discusses the storage of a device-independent color table that permits transformation of device-dependent colors to a device-independent color space. A color map as defined in Applicants' amended claims describe relationships between different combinations of source and destination color imaging systems using the color conversions and user preferences. Thus, the color map permits transformation of color values between the source and destination color imaging systems, and not simply from one device to a device-independent coordinate system. Rather, the forward transformation profiles set forth in claims 1-5, 11, and 19-23 provide that sort of transformation. On the contrary, the Lindbloom reference indicates that, even with the stored color tables, it is necessary to transform color values from  $L^*$ ,  $u^*$ ,  $v^*$  to RGB, followed by transformation to physical device coordinates using local calibration information. Accordingly, the color tables described by Lindbloom cannot be reasonably characterized as a color map as claimed.

The inventions defined by amended claims 1-5, 11, and 19-23 also can facilitate changes in user preferences without the need to reconfigure existing device profiles. As described in Applicants' disclosure, at page 13, lines 3-15, for example, use of forward transformation profiles obviates the need to use new device profiles when adding a newly defined color space, a custom illuminant, such as fluorescent light, or a new gamut mapping technique. Instead, such options can be selected by the users, e.g., using a setup

window at the operating system level. Thus, if desired, the device profiles for individual sets of imaging systems can be made relatively static and uniform, providing utility for a broader range of users. If a color map has already been constructed for a desired set of user preferences, that color map can be used for the transformation. With acceptance of new user preferences, however, color maps can be reconstructed to accommodate individual objectives. Advantageously, reconstruction relies in part on the new user preferences but makes use of the color conversions calculated from the existing forward transformation profiles.

The ICC, Lindbloom, and Stone et al. references provide no teaching that would have suggested the above features, the desirability of modification to include them, or the resultant advantages. Consequently, absent access to Applicants' disclosure, one of ordinary skill in the art would have had no appreciation of the inventions defined by amended claims 1-5, 11, and 19-23. Instead, ICC, Lindbloom, and Stone et al. would have guided one of ordinary skill in the art to follow the status quo of calculating custom device profiles for user preference changes and calculating color maps for each transformation, particularly given the ICC's adoption of such approaches as standard. Thus, the requirements of Applicants' amended claims 1-5, 11, and 19-23 run counter to not only the state of the prior art, but a well-established standard in the color management industry. On this basis, the claimed inventions would not have been obvious to one of ordinary skill in the art at the time of invention. Therefore, Applicants respectfully request withdrawal of the rejection of claims 1-5, 11, and 19-23 under section 103.

ICC, Lindbloom, and Stone et al. similarly fail to suggest the features required by amended claims 7-10. The methods of amended claims 7-10 require definition of a color map for transforming colors between color imaging systems using a color conversion and user preferences. The color conversion is performed using profiles that characterize the color imaging systems to generate device-independent color values for a source color imaging system. According to claims 7-10, in the event the color map was defined based on existing user preferences, it is applied to transform color between the color imaging systems. In the event the color map was not defined based on the existing user preferences, however, the color map is redefined using the color conversion and the

existing user preferences, as recited in amended claims 7-10. Thus, it is not necessary to redefine the device profiles when user preferences change. In particular, the color conversion performed on the basis of the device profiles for a combination of devices can be used with the user preferences to redefine the color map. As mentioned above, the ICC, Lindbloom, and Stone et al. references lack any teaching that would have suggested such features.

Claims 12 and 13, as amended, define construction of a color map as a function of both user preferences and adjusted color coordinates that represent a reduction in error between first and second device-independent color coordinates. The color map is used to transform colors between the color imaging systems in the event the color map was defined based on existing user preferences. In the event the color map was not defined based on the existing user preferences, however, the color conversion and the existing user preferences are used to redefine the color map. This feature, in particular, sets the method of claims 12 and 13 apart from the ICC, Lindbloom, and Stone et al. teachings. Again, unlike the approaches disclosed by the applied references, the method of claims 12 and 13 does not require redefinition of device profiles when user preferences change.


Amended claims 14-18 recite a system having a computer arrangement programmed to construct a color map using color conversions and user preferences. The computer arrangement uses the color map to transform colors between the color imaging systems in the event the user preferences are unchanged, but redefines the color maps in the event the user preferences have changed using the color conversion and the changed user preferences. Again, ICC, Lindbloom, and Stone et al. provide no teaching that would have suggested such features. Therefore, the system of claims 14-18 is nonobvious over such references.

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and prompt allowance of the pending claims. The Assistant

Commissioner is authorized to charge any additional fees, including any late fee, or credit any overpayment to Deposit Account No. 09-0069.

Respectfully submitted,

Date: June 18, 1999



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